100.0; Southern Pacific coast region, 100.0. There were 12 omissions to predict out of 3,690, or 0.33 per cent. Of the 3,678 predictions that have been made, 82, or 2.23 per cent, are considered to have entirely failed; 99, or 2.69 per cent, were one-fourth verified; 348, or 9.46 per cent, were one-half verified; 345, or 9.38 per cent, were three-fourths verified; 2,804, or 76.24 per cent, were fully verified, so far as can be

ascertained from the tri-daily reports.

Cautionary Signals.—89 Cautionary Signals were displayed during the month, of which 76, or 85.4 per cent, were justified by winds of 25 miles per hour or over at, or within a radius of 100 miles of the station. 12 Off-shore Signals were displayed, of which 88, or 66.7 per cent, were fully justified; 9, or 75.0 per cent as to direction; 10 or 83.3 per cent, as to velocity. 101 signals of both kinds were displayed, of which 84 or 83.2 per cent, were fully justified. The above does not include signals ordered for 50 display stations, where the velocity is only estimated. 117 cases of winds of 25 miles and over per hour, from scattered stations, were reported, and for which signals had not been ordered. 11 signals were ordered late.

NAVIGATION.

In the table on the right hand side of chart No. III. the highest and lowest stages of water, as recorded on the river gauges, occurring during the mouth of June, 1880, at Signal Service stations, are given, with the dates of the same. The following is a general resume of the condition of the rivers during the month. The Red River at Shreveport rose slowly from 9 ft. on the 1st to 17 ft. on the 20th, and fell to 14½ ft. by the 30th. The Arkansas at Little Rock remained very low and almost stationary throughout the mouth. The Missouri at Yankton rose from 6 ft. on the 1st to 10 ft. on the 5th, but fell to about 4½ ft. by the 10th; on the 13th a second rise set in which continued to end of month, when the water reached 12 ft.; at Omaha it rose from 9 ft. on the 1st to 12 ft. on the 6th; fell slowly to 10½ ft. by the 13th, and afterward rose to 16 ft. 2 in . or 2 inches above danger-line) by the 30th; at Leavenworth it rose from about 8½ ft. from 1st to 3rd, to 12 ft. on the 7th; fell to 10½ ft. on the 13th, rose to 14 ft. by the 22nd, and remained almost stationary to end. The Mississippi at St. Paul rose from 7 ft. on the 1st to 15 ft. 3 in. on the 17th, passing the danger-line, 14½ ft., on the 15th; from the 17th it fell slowly to 9 ft. on the 30th. At La Crosse it remained almost stationary, about 5 ft., until the 5th, when the rise set in; by the 19th the water had reached 15 ft. 2 in., after which it fell to 9 ft. 5 in. by the 30th. At Duboque it remained almost stationary, about 9½ ft., until the 7th, when it commenced to rise slowly, and, passing the danger-line, 21 ft. 10 in., on the 21st, reached 22 ft. 8 in. on the 23rd, after which it fell to 181 ft. by the 30th. At Davenport it remained almost stationary, about 8 ft., until the 15th, when the rise set in, and, passing the danger-line, 15 ft., on the 19th, reached 18 ft. 5 in. on the 26th. Major D. W. Flagler, U. S. Army, at Rock Island Arsenal, gives the highest water (above low water of 1863) at Rock Island bridge 17.15 ft. on the 26th and at Moline bridge 22.75 ft. on the 25th and 26th. He says, "This is the highest water of which there is any certain record along this portion of the Mississippi river, and it is certainly the highest water that has occurred since 1851. According to the best evidence I can obtain this high water was along the Rock Island rapids generally 1.08 feet higher than the high water of 1870." At Keokuk it remained almost stationary, about 9½ ft., until the 17th, when the rise set in, and, passing the danger-line, 14½ ft., on the 22nd, reached 18 ft. 2 in., on the 29th. At St. Louis, Cairo and Memphis it remained almost stationary throughout the month, rising slowly towards the end. At Vicksburg and New Orleans it changed but little throughout the month. The Ohio, at Pittsburg, remained low and almost stationary until the 13th; on the 14th, 15th and 16th, it rapidly rose to 15 ft. 11 in., after which it fell to end. At Cincinnati it remained almost stationary until the 14th, when it commenced rising and reached 24 ft. 6 in. on the 20th. At Louisville it changed but little throughout. The Tennessee, at Chattanooga, the Cumberland, at Nashville, and the Savannah, at Augusta, changed but little during the month. The high water in the Upper Mississippi during the latter half of the month resulted in immense damage to property along the banks, which will be found in detail under the head of Floods.

Icebergs.—In view of the remarkable number of icebergs and extensive fields of ice which have been reported off the banks of Newfoundland, the following table has been compiled from such marine reports as have fallen under the notice of this office. The quantity of ice reported has been greater than that of any year since 1875. In this connection, the following meterological notes are of interest: Maritime Register, June 9th.—"The past winter in southern Greenland has been very severe and the spring very stormy." London Times, June——. The winter of 1879-80 in Iceland, very mild, pressure low; early and enormous discharges of polar icefields and icebergs since March, 1880. Large iceberg reported by steamer Nederland, June 21st in 40° 12′ N., 44° 18′ W., is probably one of the most southerly ever reported in that longitude.

YEAR 1880.	Extreme lunits of ice field.						Total num- ber estima- ted as per	Dimensions of large bergs.			
								Height.		Leugth.	
MONTH,	East side.		South side.		West side.		schedule	Extreme.	Mean.	Extreme.	Mean.
	Date.	W. long.	Date.	N. lat.	Date.	W. long.	Number.	Feet.	Feet.	Feet,	Feet.
February	16	47° 00′ 46° 00′ 45° 36′	23 22 27	44° 00′ 42° 30′ 42° 50′	23 24	49° 10′ 49° 36′ 50° (0)′	25 133 87	300 120 300	125 67	500	
May June	18	45° 16′ 44° 00′	21 21	40° 35′ 40° 12′	31 21	54° 001 55° 251	779 491	300 400	130 215	15,840 2,640	2 800 1,300

Contrary to the popular opinion in this respect, these enormous fields of ice do not lower the temperature of the Atlantic Slope, which in its entire extent, from the Canadian Maritime Provinces to Florida, has experienced during May and June, mean temperatures decidedly above the normal.

High Tides.—Galveston, Tex., 12th, large portion of east part of island submerged. Cape Lookout, N. C., 16th, 17th. Ft. Macon, N. C., 18th. Portsmouth, N. C., 15th to 17th.

TEMPERATURE OF WATER.

The temperature of water as observed in rivers and harbors at Signal Service stations, with average depth at which observations were taken, is given in the table on the left hand side of chart No. II. At the following stations, the thermometers being broken, prevented observations on the dates given: Chicago, 11th to 17th; Duluth, 6th to 16th; Savannah, 2nd to 25th. The report from Punta Rassa has not been received.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—New England, 1st. 2d, 6th, 7th, 11th, 12th, 13th, 14th, 16th, 17th, 21st to 30th. Middle Atlantic States, 1st to 3d, 6th to 14th, 16th, 17th, 21st to 30th. South Atlantic States, 1st, 2d, 3d, 6th, 7th, 8th, 9th, 11th to 16th, 25th, 30th. Lower Lake region, 6th, 9th to 14th, 25th to 30th. Upper Lake region, 1st to 6th, 9th to 15th, 18th, 19th, 23d to 30th. East Gulf States, 1st to 15th, 19th to 30th. West Gulf States, 1st, 2d, 5th, 6th, 9th to 16th, 20th to 30th. Ohio valley and Tennessee 2d, 6th, 11th to 14th, 19th to 30th. Upper Mississippi and Lower Missouri valleys, 1st to 30th. Eastern Rocky Mountain slope, 4th, 12th, 17th, 18th, 20th to 25th, 29th, 30th. Arizona, 19th, 20th. Oregon, 10th. Washington Territory, 7th.

Auroras.—On the 12th the aurora was observed in New Hampshire and Wisconsin, and at Veyay, Ind-Cloudy weather in the Lower Lake region probably prevented observations in that section. On Mt. Washington, at 8 p. m., faint; color, pale straw. Milwaukee, from 8 to 9 p. m., faint; color, pale blue, changing to indistinct orange; altitude about 10°; no motion. Vevay, Ind., until 1:30 a. m. of the 13th; altitude about 45°; faint flashes of white light, alternating with faint pulsations of crimson color. On the 15th auroral displays occurred from Maine to Dukota. Gardiner, Me., not visible at 9, but quite bright from 11 p. m. to 1 a. m. At Montreal, Can., auroral display. Burlington Vt., faint with distinct dark segment. from 11:15 p. m. to 12:15 a. m. of the 16th. Milwaukee, from 8 to 9 p. m., from N. to W.; faint; altitude about 5°; color well defined blue, shading into orange at the horizon; motionless, except slight tremor in blue light. Escanaba, 9 p. m. to 10:15 p. m.; arch of pale yellow, extending from 45° to 60° azimuth; altitude about 20°. Pembina, 9 p. m., faint, but indistinct, owing to bright moonlight. 16th, displays reported from Vermont to Iowa. Burlington, Vt., from midnight to 12:30 a.m. of the 17th; faint, no definite characteristics. Escanaba, 8:45 p. m., of increasing brilliancy till 9:30 p. m., then gradually fading away; disappeared at 11 p. m.; well defined beams of 2° breadth, reaching an altitude of 45°; color, pale yellow. Thornville, Vich., from 9:30 to 10 p. m., faint: slight movement of rays from E. to W. Monticello, Ia., display at 11 p. m. Isolated cases of displays occurred as follows: Gardiner, Me., 18th, from 1 a. m. to 2:30 a.m.; extent, 45° from N. to NE., resembling the light of the rising moon. Burlington, Vt., 14th, faint from 11:15 p. m. till after midnight; bright arch of light. Burlington, Vt., 27th, from 12 to 12:25 a. m., bright arch, with distinct dark segment, but no streamers. Milwaukee, 11th, 8 to 10 p. m., faint; extending from N. to W.; color, pale blue, shading to indistinct orange at horizon; interspersed with dark hazy streaks, seemingly arising from nucleus of dark segment; no perceptible motion. Pembina, 14th, 9:40 p. m., to morning of 15th, extent from 180° to 255° azimuth; altitude, 15.°. One narrow arch, lower edge well-defined, but upper irregular and broken, with motion as of faint phosphorescent flames, rising from a ribbon of half-smothered fire; marked intermittence of brilliancy. Occasionally quick luminous rays shot towards the zenith, with the tremulous motion characteristic of "merry dancers." The peculiarity of the display was the color of the arch, which was uniformly green, var ing in shade, but at no time displaying any other variety of color. Independence, Iowa, 5th, auroral display. St. Meinrad, Ind., 3d, 8 to 9 p. m., in NW., faint, extent, 35°, altitude, 20°; 10th, 9 p. m., faint on account of bright moonlight; 11th, 9 to 11 p. m., extent, 120°, altitude, 30°, diffuse arch of yellowish white. Bellefontaine, Ohio, 26th, 9 p. m., seen through rift in clouds. The most southerly station reporting during the month was St. Meinrad, Ind.

OPTICAL PHENOMENA.

Solar and Lunar Halos were not very numerous during the month, but were most frequently observed along the Atlantic coast, in Tennessee and the Ohio valley and in Oregon.

Mirage.—New London, Conn., 12th, nearly all day and from 8 to 8:30 p. m.

MISCELLANEOUS PHENOMENA.

Earthquakes.—San Francisco, Cal., 24th, 12:47 a. m.

Prairie and Forest Fires.—Pike's Peak, 4th, 7th, 8th, 11th, 14th, 16th, 19th; Santa Fe, 8th to 14th; Colorado Springs, 9th.

Locusts. -- 30th, Hudson, Mich., very numerous one mile west of this place. Umatilla, Or., very nume-